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ALFRED EISENSTAEDT-PIX

THIS YUGOSLAV GIRL ENJOYS DRESSING UP IN HER RESPLENDENT COSTUME

In the open regions of the north—the vast plains area of the rivers Sava, Drava, Danube, and Tisa—are found the richest, most productive, and most densely populated sections of the country. They form the nation's granary, and provide a valuable source for such farm and orchard output as corn, grapes, plums, tobacco, sugar beets, and livestock.

Of the 16,000,000 people, nearly one-half belong to the Serbian Orthodox church, 37 per cent are Roman Catholics, 11 per cent profess Mohammedanism, and the rest are Greek Catholics, Protestants, and Jews.

Most of these groups live in regional blocs and are not scattered evenly over the entire country. They cling to costumes (illustration, cover) and traditions handed down from past generations. Mutual distrust has been fostered by poor transportation and mountain barriers.

NOTE: Yugoslavia is shown on the National Geographic Society's Map of Europe and the Near East. A price list of maps may be obtained from the Society's headquarters, Washington 6, D. C.

For further information, see "The Clock Turns Back in Yugoslavia," in the *National Geographic Magazine* for April, 1944.

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Racial Unity Is Tie That Binds Yugoslavia

YUGOSLAVIA, born of World War I, was thrust by World War II into the center of some of Europe's knottiest problems. Along its borders seethe the Trieste and Venezia Giulia issue and the Greek-Albanian question. In its northwest extremity occurred the recent shooting down of United States planes, incidents which have made Yugoslavia a name familiar to every American.

This Balkan country is a jigsaw puzzle (map, page 3) of many diverse elements. The differing cultural, political, and religious groups are held together by a federated-republic type of government headed by Marshal Tito (Josip Broz) as premier. Common Slav ancestry is the tie that binds the Yugoslavs (south Slavs) together.

Marshal Tito Came to Power During World War II

Yugoslavia sprang full-grown into the family of European nations in 1918 when Slovenia, Croatia, Dalmatia, Bosnia, and other areas of the defeated Austro-Hungarian Empire joined with the independent kingdoms of Serbia and Montenegro. Nucleus of the infant kingdom was inland Serbia, whose royal house provided a king—Alexander I.

Throughout World War II bitter internal strife surged between supporters and opponents of the monarchy. By the end of 1944, during which much of Yugoslavia was freed of German control, the resistance movement headed by Marshal Tito had set up a national administration. Under its direction came the election of the Constituent Assembly that has declared an end to the monarchy.

Serbia, Croatia, Slovenia, Bosnia-Hercegovina, Montenegro, and Macedonia have been named as six units of the Federal People's Republic of Yugoslavia. In addition, there will be areas within states having autonomy and limited representation in the assembly. Voivodina in the northeast and Albanian-populated regions in the south are in this class. This pattern of government closely follows that of the Soviet Union.

Because of its strategic position on routes from central Europe to the Mediterranean and Middle East, Yugoslavia felt the constant force of external as well as internal pressures. Belgrade (Beograd), the capital and chief city, with a population of 300,000, was heavily damaged by German air attacks in 1941, and by Austrian bombardment in 1914.

Regions Run Gamut of Geographic Types

For its size (comparable to Oregon), Yugoslavia has a topography as varied as any in the world. Slovenia, in the northwest against the Italian frontier, presents a high, rugged Alpine district; next-door Croatia on the south is a "transition" hilly area; Slavonia, east of Croatia, is another transition region, but of the lowland type, blending into the Hungarian plain. In contrast are the island-studded, rugged coastlands of Dalmatia, and mountainous Bosnia, Hercegovina, and Montenegro.

Serbia, the largest and itself most diversified region of all, combines mountains, plateaus, plains, and fertile river valleys. Its Vardar River, in the south, flows through the mountain break that leads into Greece.

increased by a heavy load of silt which literally scours rocks away.

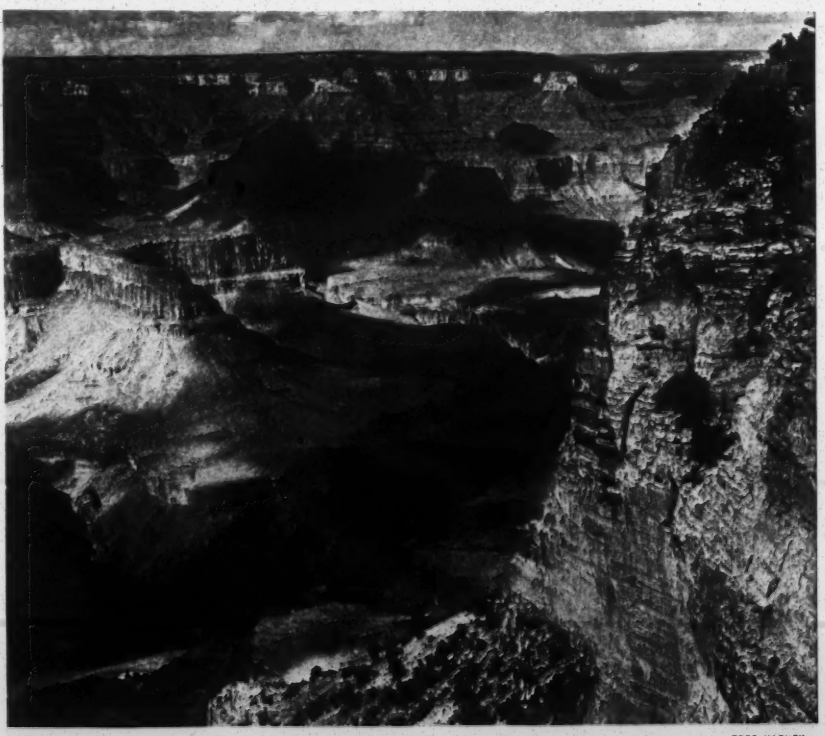
The estimated silt load carried by the Colorado through Grand Canyon equals the tonnage hauled by a continuous line of 10-ton trucks, traveling 25 miles an hour, going past a point at intervals of 30 feet.

The cleft the river carves through the rock strata is an open book of geology. The oldest rocks (Archean) known to man are visible, as well as formations of the next two geologic ages. The area around the canyon is like a dome; it is raised higher than the surrounding territory. This accounts for the relative coolness of the park and for the fact that the canyon is immediately surrounded by forests, not desert. From the point of view of plant and animal life, a trip from the top of the north rim to canyon bottom is like traveling from southern Canada to Mexico.

Hopi House, a reproduction of a Pueblo Indian dwelling, and several Navajo hogans—temporary desert shelters—afford great interest. Navajos and Hopis dance daily. At Desert View a vista of the canyon is nearly equalled by the Painted Desert and Navajo lands to the east.

NOTE: Grand Canyon National Park may be located on the Society's Map of the Southwestern United States.

For further information, see "Nature's Scenic Marvels of the West," in the *National Geographic Magazine* for July, 1933*; and "Surveying the Grand Canyon of the Colorado," May, 1924. (*Issues marked with an asterisk are included in a special list of Magazines available to teachers in packets of ten for $1.00.*)



FRED HARVEY

AS VARYING LIGHTS AND SHADOWS PLAY UPON IT, GRAND CANYON NEVER LOOKS TWICE THE SAME; THE COLORADO, FAR BELOW, DIGS DEEPER AND DEEPER

NATIONAL PARK SERIES: No. 1

Grand Canyon, Gigantic Statement in Stone

(This story inaugurates a series of articles on U. S. National Parks)

SPECTACULAR, breath-taking, awesome, thrilling—these are but a few of the sudden expressions that burst from the lips of visitors as they peer down into the depths of one of America's natural wonders, the Grand Canyon of the Colorado.

So magnificent is the view from the canyon rim that in 1919 a section of more than 100 miles along the cascading Colorado River in northern Arizona was declared Grand Canyon National Park.

Mammoth formations rising and tumbling in the mile-deep, fifteen-mile-wide canyon reflect amazing changes of color so striking as to nearly defy description. John Muir, Western naturalist and a national parks enthusiast, could only say that Grand Canyon seemed "a gigantic statement for even nature to make." Awed by the colors within the abyss, he said, "Whose brush or pencil, however lovingly inspired, can give us these?"

A Prediction That Went Wrong

Early explorers of the canyon were impressed largely by the fact that the river which "dug" the canyon was too deeply entrenched to be useful for drinking. In 1857 Lieutenant Joseph Ives had orders to explore the "big cañon." "After entering the region," he reported, "there is nothing to do but leave. Ours has been the first and will doubtless be the last party of whites to visit this profitless locality."

Hundreds of thousands of visitors a year belie this prediction. With no fear of where their next drink of water is coming from, they lean on the guardrail at the brink of the chasm and look down on varicolored upflung rocks that would be great mountains if placed on a level surface.

There are really two national parks at Grand Canyon—the south rim and the north rim. Except for a 21-mile pack trail between them, they are separate and unconnected. By road, the shortest route is 215 miles from rim to rim. Snow closes the north rim in the winter. The south rim, about 1,200 feet lower, has less severe weather and its facilities remain open all year. Road and railroad serve it. Both rims have airports.

Canyon Hikers Must Be Hale and Hardy

For many south rim visitors the big adventure is a muleback trip down Bright Angel Trail to the river's edge. Kaibab Trail, starting three and one-half miles east of Grand Canyon Village, zigzags to the Colorado, crosses it on a suspension bridge, and climbs the north rim.

Hale and hardy vacationists may walk along these trails to the canyon bottom. It is no easy hike, being comparable to climbing a mile-high mountain in reverse sequence—going down first, then climbing back up. The climb up (usually in the heat of the afternoon) gives many hikers more than they bargained for. The round trip measures at least 14 miles.

Seen close up, the Colorado is quite different from the tiny ribbon it seems from above. It roars by at speeds up to 20 miles an hour, measures 300 feet across, and it is as much as 42 feet deep. Its erosive power is

of the people increased. The population grew from less than 7,000,000 people in 1898 to an estimated 18,000,000 in 1945.

The city-dwelling Filipino is a counterpart of his American cousin. He dresses in the same fashion, buys many of the same products, and goes to air-cooled movies. Most of the islanders, however, prefer a rousing cockfight to a movie. The gregarious Filipinos enjoy all social occasions. They usually live in villages, or *barrios*, rather than on isolated farms.

Even before the Spanish-American War the United States had become the number one customer for Philippine products, but supplied few of the islands' imports. Just before World War II, however, the guardian republic had climbed to sixth place on the list of the Philippines' customers.

Under the Philippine Trade Act of 1946 the islands will receive preferential trade treatment from the United States until their industry is strong enough to compete unprotected in world trade.

NOTE: The various islands of the new Republic of the Philippines may be located on the Society's Map of the Philippines.

For additional information, see "Mindanao, on the Road to Tokyo," in the *National Geographic Magazine* for November, 1944; "Facts About the Philippines," February, 1942*; and "Return to Manila," October, 1940*.

J. BAYLOR ROBERTS

MARYLAND-TRAINED FILIPINA HANDS TEND GROWING FILIPINO TEETH

This young islander received her dental training at the University of Maryland. In her Manila office she guides the growing teeth of a young compatriot. Comic posters and the super-size spider pin on the dentist's blouse keep his mind off her work.

Philippines Join Ranks of Free Nations

TO AMERICAN students the outstanding government change of the summer was the establishment of the Republic of the Philippines on July 4—170 years after the signing of the Declaration of Independence.

The United States Congress, for sentimental reasons, named that date in the 1934 Tydings-McDuffie Act which guaranteed the Philippine Islands independence in 1946. In the 12-year interim, except for the period of Japanese occupation, the islands virtually governed themselves as the Commonwealth of the Philippines.

Official ties between the United States and its Pacific ward were broken after nearly half a century of guardianship, at a time when the islands were still rebuilding after the ravages of World War II.

The United States Fought Out and Bought Out Spain

The Philippines lie off the coast of Asia, between Formosa and the Netherlands Indies. Manila, the capital, is nearly 7,000 miles southwest of San Francisco. The 7,083 islands that compose the archipelago range from formidable rocks to areas of wide, fertile valleys and mountain-peaked tropical jungle.

Only 1,095 of the islands are inhabited. The 11 large ones—Luzon, Mindanao, Samar, Palawan, Panay, Negros, Mindoro, Leyte, Cebu, Bohol, and Masbate—contain 95 per cent of the land. On Luzon, Manila lies at the head of a beautiful landlocked bay into which the American Admiral Dewey sailed in 1898 to defeat the Spanish fleet.

By the Treaty of Paris, which formally ended the Spanish-American War, Spain turned over the Philippines to the United States on payment of $20,000,000.

The 1,000-mile stretch of archipelago has a fairly homogenous population of Malay extraction. The principal minority groups are the Mohammedan Moros of Mindanao (illustration, page 12) and Sulu, 700,000 strong, and the 600,000 members of pagan tribes of northern Luzon and other areas.

The Tagálogs of Luzon form one of the most important groups in the islands. Their language, along with English and Spanish, is official. The Visayans, who live in the many islands between Luzon and Mindanao, are more numerous, however. The president, Manuel Roxas, is a Visayan.

Education Advanced under American Administration

American officials who went out to the islands at the turn of the century found that the Filipinos had a strong Spanish heritage. Most of the natives were Christians. In the archipelago were universities older than any in the United States. At Santo Tomás, older than Harvard, the Japanese interned hundreds of Americans from 1942 to 1945.

During the Spanish regime, education was for the few. Under American supervision more schools were developed and modern principles of medicine and sanitation were established. Filipinos, both men and women, attended medical schools in the United States and returned to the islands to help in the advancement of their people (illustration, page 7). Epidemics were wiped out, the death rate lowered, and the physical stature

widely exported.

The chief project of the five-year plan, Soviet authorities say, is the iron and steel works being built near industrial Tiflis, already a city of more than half a million people.

Not far from Tiflis, the small town of Gori, in which Stalin was born, is surrounded by fruit orchards. A specialty of the region is the Gori peach.

NOTE: The Georgian S.S.R. may be located on the Society's Map of the Union of Soviet Socialist Republics.

For further information, see "Roaming Russia's Caucasus," in the *National Geographic Magazine* for July, 1942*.

JULIEN BRYAN

TWO SOVIET GEORGIA FARMERS COLLECTIVIZE THEIR EFFORTS TO MOVE A CART

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Soviet Georgia Advances Own Five-Year Plan

IN THE next five years, progress may be on the march through Georgia —the Georgia where Stalin was born, that is. This republic in the Caucasus area of the Soviet Union is reportedly embarking upon a new five-year program of industrial and farming development. At the end of that period, its pride in being the home state of Russia's leader may be matched by its improved economic condition.

Already a new railroad, built during the war, has been opened to general use along the Black Sea coast, saving hundreds of miles between Moscow (Moskva) and the Georgian capital, Tiflis (Tbilisi).

Yesterday Meets Tomorrow

Steel rails now form a complete loop around the towering, travel-hampering ranges of the Caucasus Mountains. The southern section of the loop runs through the heart of Georgia, and is paralleled by an oil pipeline that carries "liquid gold" from Caspian oil fields to a Black Sea outlet at Georgia's port, Batumi.

Past and future meet in the Georgian Soviet Socialist Republic, to give the land its full name. On mountain tops, scientists with radio sounding balloons study tomorrow's weather conditions, while tribesmen tend their flocks and farms after the simple, primitive ways of their ancestors (illustration, next page).

Among Georgia's three and a half million people are some of the most interesting of the Soviet Union's "national minority" groups, whose languages and culture are preserved through the efforts of a special government bureau.

The Georgians, an ancient Asia Minor people subdivided into a number of related tribes, make up the majority of the population. But complex racial strains, including Russian, Turkic, Persian, Greek, and Armenian, bear witness to the region's old place on traffic lanes between Europe and Asia.

Many of the minorities still wear their native costumes, in spite of modern innovations in automobile roads, radio, schools, and community clubs now penetrating to the long-isolated mountain pockets of Georgia. Known around the world is the traditional Caucasus outfit—the long, fitted coat with its breast cartridges, the dashing lambskin cap, and the dagger at the belt.

Rich Mines, Fertile Soil

Within an area less than half that of Illinois, the Georgian S.S.R. holds many raw materials. From its mountains, whose glacier-locked peaks rise in places above 16,000 feet, come manganese, copper, molybdenum, oil, coal, and iron.

Rushing streams supply hydroelectric power. Wood industries feed on extensive forests. Silk and cotton textiles, and wine and wood-processing plants use local supplies.

In fertile valleys, and in the reclaimed marshes of coastal Colchis, famed in Greek legend as the Land of the Golden Fleece, are rice, tea, and tobacco plantations, and many vineyards and orchards, whose products are

other Indians reached a peak a thousand years ago. As the Spanish pushed into Central America, some Indian remnants disappeared. Even after three centuries, however, Indian stock prevails in number over that of the whites and of the Negroes.

Dense tropical forests and malarial swamps long formed a "Chinese wall" along the wide lowland of Central America's Atlantic coast. Mountains rising to 11,000-foot chains of volcanic cones on the Pacific side likewise defied the white man's efforts to exploit the lush territory. His early settlements were along the Pacific or in the near-by temperate highlands.

Most farming is still primitive, mine and forest resources are little touched, and manufacturing barely exists. But the expansion of coffee plantations in the rich volcanic soil of the highlands and of banana plantations in the lowlands has forced the construction of roads and railways connecting coasts.

Steamship and airplane lines complete the job of bringing Central America close to United States trade centers. Important among transportation arteries, too, is the 3,300-mile all-weather Inter-American Highway from the United States-Mexican border to South America, completed except for short stretches.

In population as well as in area the five states are about one-sixth greater than California. The two largest, Nicaragua and Honduras, each comparing with New York State in size, are the least thickly settled. Maryland-sized El Salvador, smallest and most densely populated, borders the Pacific and is the only one without a coast on both oceans.

NOTE: The Central American Republics may be located on the Society's Map of Mexico, Central America, and the West Indies.

For additional information, see "Land of the Painted Oxcarts" (Costa Rica), in the *National Geographic Magazine* for October, 1946; "To Market in Guatemala" (19 colored photographs), July, 1945; "Coffee Is King in El Salvador," November, 1944; "Land of Lakes and Volcanoes" (Nicaragua), August, 1944*; and "Honduran Highlights," March, 1942.

NATIONAL GEOGRAPHIC SOCIETY CONTINUES COSMIC RAY RESEARCH

SUPPLEMENTING the aerial research performed this summer by the B-29 "flying laboratory," the National Geographic Society has announced that a new count of cosmic ray activity will be made from a surface ship on a course extending from the United States to South America.

The special equipment carried in the B-29 will be transferred to an ocean vessel to record cosmic ray intensity along a sea-level route. Determining the number of cosmic rays at different heights and latitudes is a valued contribution to basic scientific information. These little-known particles of great energy constantly bombard the earth from outer space, but their origin and much about their nature have not been ascertained.

Cosmic rays are the most penetrating known form of radiation. They pass through the human body 10 to 20 times a second. Their energy is indicated by the fact that they have passed through 75 feet of lead, and also have been found in deep mines.

Recording this invisible cosmic radiation as it shoots toward the earth is similar in principle to measuring rainfall. There is further ground for the comparison in the fact that one sample is sufficient to measure rain or radiation in a small area, but to obtain a pattern for a large area, many tests must be made. The Army Air Forces and the Bartol Research Foundation of the Franklin Institute at Philadelphia cooperated with the Society in the research.

The B-29 series of observations covered a path about 4,800 miles long—from 50 degrees north latitude, near the Canadian border, to 20 degrees south latitude, off the coast of northern Chile. The latter point marks the approximate location of the Magnetic Equator. Two of the round-trip flights were made at an altitude of 5,000 feet, and one round-trip flight each was made at 15,000, 25,000, and 35,000 feet.

Central American States Observe Freedom

THE September 15th Independence Day for five Central American republics—Guatemala, Honduras, El Salvador, Nicaragua, and Costa Rica —had a special significance this year. It was a century and a quarter ago, in 1821, that the forebears of the 8,000,000 inhabitants of these republics first let freedom ring from the volcanic mountainsides of their various countries.

The territory for which independence from Spain was proclaimed at Guatemala City in the 1821 revolution was known as the Captaincy General of Guatemala. In addition to the land of the five states named, it included Chiapas, which later chose to become part of Mexico.

Three years later the five states became the United Provinces of Central America, with a constitution modeled after that of the young United States. But the rugged physical features of the region hampered communication, leadership was lacking, and the feeble bonds of union dissolved within a dozen years.

Throughout much of this region the civilizations of the Mayas and

THOMAS F. LEE

AN INDIAN FAMILY ON THE MOVE RESTS IN FRONT OF TECPÁN'S CHURCH

The white walls glaringly reflect the Guatemalan sun, and the lone spiked cedar casts little shade; still the travelers choose the open area near the church door for a stopping place. Tecpán is an upland town west of Guatemala City, capital of the northernmost Central American republic.

RUTH ALLEN

A SKIRTED MORO OF MINDANAO STRIDES ACROSS A GRACEFUL ROPE AND BAMBOO BRIDGE TOWARD A PHILIPPINE VILLAGE

An artistic and engineering triumph, this fragile-looking span near Lake Lanao is strong and durable. Its Moro builders are Mohammedans. Split-bamboo walls allow householders to look out while preventing outsiders from peering in. The Moros form a religious minority in the largely-Christian Philippines (page 7).

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